REMARKS

Status of Application

Claims 1 – 34 remain pending in the present application. Applicants have amended Claims 1, 4, 19, 25, 27, and 29 to more clearly define the invention; however, these amendments were not made to further distinguish these claims over the cited art, since the claims as filed already do so and are thus patentable over that art.

Claims Rejected under 35 U.S.C. § 102(b)

The Examiner has rejected Claims 1 – 34 as being anticipated by Brown et al. (U.S. Patent No. 6,065,551 – hereinafter referred to as "Brown"). The Examiner asserts that Brown discloses a method for synchronization of data stored on a server that includes steps identical to those recited by applicants' claims and therefore anticipates all of these claims. As explained below, applicants respectfully disagree with the Examiner's rejection, since there are clearly significant and nonobvious differences between the method taught by Brown and the invention as defined in each of applicants' claims.

In the interest of reducing the complexity of the issues for the Examiner to consider in this response, the following discussion focuses on independent Claims 1, 11, 19, and 25. The patentability of each remaining dependent claim is not addressed in detail; however, applicants' decision not to discuss the differences between the cited art and each dependent claim should not be considered as an admission that such dependent claims are not patentable over the cited references. Similarly, applicants' decision not to discuss differences between the prior art and every claim element, or every comment made by the Examiner, should not be considered as an admission that applicants concur with the Examiner's interpretation and assertions regarding those claims. Indeed, applicants believe that all of the dependent claims patentably distinguish over the art cited. However, a specific traverse of the rejection of each dependent claim is not required, since dependent claims are patentable for at least the same reasons as the independent claims from which the dependent claims ultimately depend.

While Brown addresses a related problem of dealing with changes made to files stored on a server that is accessed by multiple users, there are clearly very significant differences between the method taught by Brown and the invention defined by each of applicants' claims. It is important to understand several key differences between the problem addressed by Brown and that addressed by the claims of the present invention. Brown is directed to solving a very specific problem in which

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multiple users can simultaneously employ a word processing program to download and edit a document that is stored on a server. Brown recognizes the problem that previously existed in regard to a second user attempting to access a master copy of a document stored on a server, where the master copy is already opened for editing by another user. In addition, Brown recognized the need to reconcile the various edited versions of a master copy of a document that is being simultaneously edited by multiple users in a network. Brown recognized that problems can arise when users attempt to save their different edited versions to the server storage, either while any user is still editing the document or after editing is completed. Further problems addressed by Brown are discussed at col. 1, line 12 through col. 2, line 45 of the reference.

The present invention is directed to solving a different problem that addressed by Brown. In an exemplary application of a preferred embodiment of their invention that is discussed by applicants in the specification, the present invention is employed to solve the problem of synchronizing data for electronic schoolwork or assignments. Teachers and students typically access a server on which assignments are stored, by communicating over a LAN or over the Internet using a conventional Web interface, such as Microsoft Corporation's Internet Explorer™ browser program. While connected to this server, a teacher can make assignments of work to be completed by the students, who then access the assignments, complete them, and store the completed assignments on the server to be graded by the teacher. The work by teachers or by the students can be carried out either online or offline, e.g., at home or at school. The teacher may want to periodically synchronize a local store of the assignment and class data (i.e., local to the teacher's client computer) with that stored on the server and then work either online at school or at home – when connected to the server, or offline at school or home – while not connected to the server over the network or the Internet. Teachers can collaborate on work for a class, and each teacher/teaching assistant can work on assignments when and where they choose.

When teachers attempt to synchronize with the server, they will receive a download of changes previously uploaded by any other teacher, for the data related to a specific class. The present invention thus ensures that data nodes, such as assignments and papers, are synchronized between the clients and the server and detects any collisions of the nodes that have been modified, for example, in the event that two individuals changed corresponding assignments or other kinds of nodes. To simplify and improve the performance of this synchronization process, the present invention is

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incremental, because it ***only*** transfers ***information (i.e., components or nodes) that has changed since a previous synchronization between the server and a client computer of the teacher last occurred.***

The server stores data that comprises discrete components or nodes, which can be discretely modified. The term "data" is thus used in applicants' claims to encompass a plurality of components or nodes. In the example discussed by applicants in their specification, the nodes can be assignments that comprise data for a specific class. In contrast, Brown teaches enabling synchronization of a word processing document that is simultaneously being edited by a plurality of users. Accordingly, there is no corresponding concept in Brown that might be viewed as equivalent to the term "data" as used in applicants' claims. The Examiner has apparently overlooked the specific details of applicants' claims in regard to the distinction between "data" and "components" (Claim 1), or between "data" and "nodes" (Claims 11, 19, and 25). These two terms, data and components/nodes, are recited in the independent claims defining applicants' invention in a way that clearly patentably distinguishes the present invention from Brown, since Brown does not include any corresponding relationship in the technique disclosed therein.

It will be helpful to initially consider the specific language of Claim 1 in appreciating how applicants' claims distinguish over Brown; the same differences generally also exist in each of the other independent claims. Claim 1 (as amended above) is reproduced below to facilitate this discussion.

> A method for maintaining synchronization of data stored on a server, where components of the data are discrete objects that are separately modifiable on clients that are coupled to the server over a network and wherein modification to the components of the data on the clients can be uploaded to the server, comprising the steps of:
>
> (a) associating a version identifier with the data, said version identifier being incremented each time that a change to any component of the data occurs on the server;
>
> (b) each time that a component of the data is modified on the server, assigning to the component the value of the version identifier that was current at the time the component was modified on the server, other of the plurality of components comprising the data, which were not then modified, retaining a version identifier previously assigned thereto; and
>
> (c) detecting a proactive collision between a component of the data just downloaded to any client and a modified version of said component that was previously downloaded and modified by a user on said client, as a function of the values of version identifiers associated with the component downloaded and the

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modified version of the component, causing an indication of the proactive collision to be provided to the user, enabling the user to resolve the proactive collision.

The preamble of Claims 1 recites "a method for maintaining synchronization of data stored on a server" and indicates that the ***data*** are "discrete objects that are separately modifiable on clients that are coupled to the server over a network." Thus, the term "***data***" is clearly defined in the preamble. Subparagraph (a) recites the step of "associating a version identifier with the data." The Examiner should note that the claim does not indicate that the same version identifier is associated with all of the ***components*** of the data. This subparagraph also indicates that the version identifier associated with the ***data*** (again – not the version identifier of each component comprising the data) is "incremented each time that a change to ***any component of the data*** occurs on the server." Next, subparagraph (b) recites that each time a component is modified, the version identifier that was then current at the time that the component was modified on the server is assigned to the component. The other components comprising the data on the server retain the version identifier that was previously assigned to them when they were last modified. Accordingly, different components of the data have a specific version identifier corresponding to the version identifier associated with the data when the component was last modified. As a result, components modified at different times on the server will have different version identifiers.

This relationship between the version identifier of the data on the server and the version identifier assigned to each of the components comprising the data on the server is clearly NOT disclosed or suggested by Brown. Instead, Brown only deals with version identifiers associated with successive versions of a word processing document that are stored on a server. The approach used by Brown is therefore entirely different than the method claimed by applicants.

This difference between Brown and the claims is not trivial, since it is the basis for applicants' invention being able to download only the components that have been changed on the server when a client requests a download of the "data" for a class. Based on the technique disclosed in Brown, the server could not download only those documents that had changed when a client requests all the data for a specific entity, such as a class, since Brown does not employ a version identifier associated with data for such an entity. The concept of "data" comprising components (or nodes) does not exist in Brown

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Subparagraph (c) also recites another significant difference between applicants' claimed invention and Brown. Applicants' specification defines the term "proactive collision" as the circumstance "detected during the download from the server of a node ["node" is equivalent to "component"] that was modified previously by another party, where the downloaded node corresponds to a node that was modified on the client since a previous synchronization by the client occurred. (See page 4, lines 19-27 of applicants' specification.) In this case, it will be apparent that the just downloaded component must have been modified by another party and then uploaded onto the server, causing it to be assigned a new version identifier that is different than the version identifier of the modified component already stored on the client. Brown does not resolve any similar issue, but instead only detects conflicts that arise when a client attempts to ***save*** an edited file to the server. Applicants' claims define the detection of a ***proactive collision*** on the client when the client downloads data from the server, in regard to a saved modified component (or node) that is on the client.

Detecting a synchronization problem arising from a proactive collision during a download is not the same as detecting a synchronization problem that occurs during an upload of a modified component from the client to the server. Indeed, applicants refer to that type of collision separately as a "reactive collision" and define a reactive collision as follows.

> ... a reactive collision occurs during upload of a node by a second client after a first client has completed uploading of a corresponding modified node at about the same time as the second client. During the second client's upload, the server notices that the original version identifier of the node being uploaded by the second client is different than the server's current version identifier, which indicates to the server that a modified version of the node has been uploaded to the server since the time that the second client downloaded the node. The server then aborts the second client's upload process, and the second client is caused to restart the synchronization process so that the collision can be detected as a proactive collision and handled appropriately by the user of the second client. (See applicants' specification, page 5, lines 6-15.)

Fig. 2E of Brown indicates that the local copy of the document is cleared and the local copy of the ***record file*** is cleared in the MDF that was opened on a client when the user started to edit a word processing document. The record file for a user in Brown indicates the version of the document being edited by the user. Thus, once the user has finished editing the document and has saved the edited document to the server, the version identifier for the document is not retained on the client. When the client next downloads the document, there will be no version identifier retained on the

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client for the previously modified document against which the client can compare the version identifier of the just download document. Accordingly, it should be apparent the Brown cannot function as recited in Claim 1.

In applicants' independent Claim 11, subparagraphs (a) and (f) clearly distinguish over Brown for the same reasons as noted above in connection with Claim 1. Similarly, subparagraphs (a) and (h) in Claim 19; and, subparagraphs (c)(ii)(1) and (c)(iii)(5) in Claim 25 distinguish over Brown for these same reasons. Further, Claims 11, 19, and 25 all recite additional details that are not disclosed in Brown. The Examiner is respectfully requested to carefully review each of these independent claims, to better appreciate the substantial differences between applicants' claimed invention and the teaching of Brown. It will thus be evident that Brown neither anticipates nor renders applicants' claims obvious, and these independent claims are thus patentable over Brown.

While each of the dependent claims are patentable for at least the same reasons as the independent claims, applicants also note that many of the dependent claims are patentable for additional reasons. For example, Claim 2 recites that detection of a reactive collision causes the step pertaining to detection of a proactive collision and its report to a user for resolution to be carried out, but Brown does not teach or suggest a proactive collision as defined by applicants' claims. Accordingly, Claim 2 is patentable over Brown.

Claim 4 provides that the user is enabled to resolve a proactive collision either by "overwriting the modified version of the component with the component that was just downloaded," or by "uploading the modified version of the component to the server, so that a corresponding component on the server that was changed since the previous version of the component was downloaded and subsequently modified by the user, is overwritten with the modified version." Again, Brown cannot disclose any equivalent user option, since Brown does not detect proactive collisions, as defined by applicants' claims. Recall also that Brown only resolves conflicts occurring when a client is saving a revised document to the server, while applicants' proactive collisions are detected when a component or node has just been downloaded from the server to the client.

In rejecting Claim 6, it appear that the Examiner has misconstrued subparagraph (d), which recites "automatically deleting each component on the client that was deleted on the server since the client was last synchronized with the server." There is no teaching in Brown of this step and it is clearly not taught or suggested at col. 15, lines 9-23 of Brown (as asserted by the Examiner), which

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instead, discusses how a user resolves conflicts detected when ***uploading and saving*** a document to the server.

Claim 7 recites the step of maintaining on each client "a server cache in which components most recently downloaded from the server are stored; and a client store in which components of the data that have been modified on the client, but not yet uploaded to the server are stored." The Examiner cites to Brown, Fig. 3 and col. 11, lines 43-57, which describe how an MCF 100 for the master copy is created by the user's word processor and saved in resident system memory on the file server. There is no teaching or suggestion in Brown, of a server cache ***maintained on each client***, in which components of the data most recently downloaded from the server are stored, or of a client store ***maintained on each client***, in which components modified on the client and not yet uploaded to the server are stored. Indeed, in Brown, there is no teaching or suggestion that a document modified previously on a client, as well as a just downloaded document are both separately stored on a client at the same time.

Many of the corresponding claims in each group of claims in the present application also differ from Brown for the reasons noted above. Other dependent claims not discussed above, if read carefully, will be found to patentably distinguish over Brown. Accordingly, all claims in the present application are novel and non-obvious over the art cited and therefore patentable. In consideration thereof, it is submitted that the present application is in condition for allowance, and the Examiner is requested to pass this case to Issue without further delay. Should any other questions arise, the Examiner is requested to telephone applicants' attorney at the number listed below.

Respectfully submitted,

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RMA:lrg

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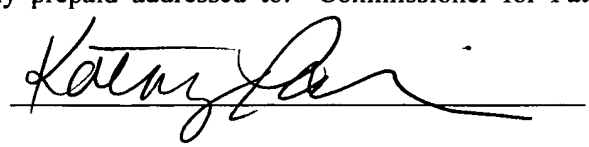

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